

perior outcome. Present economic theory does not support, and there is insufficient factual basis to justify, mandating interconnection between CMRS providers, mandating a common air interface standard, or mandating access to subscriber databases to support roaming based on externality arguments. (Section VIII)

C. Resale

16. The Commission's rationale for cellular resale obligations is that cellular carriers would have an incentive to deny resale in order to price discriminate, to monopolize the retail marketing and distribution of cellular services, and to delay the entry of CMRS competitors. These concerns are unwarranted. Unlike the landline bottleneck, the ability of a cellular provider to practice anti-competitive price discrimination is limited by competition from the other cellular system and other CMRS providers (e.g., SMR, paging). There are no grounds for believing that a resale obligation is necessary to prevent cellular carriers from leveraging market power from the wholesale to the retail level, assuming they had such power. The argument that early entrants into an industry should be required to facilitate the entry of subsequent competitors cannot be accepted as a general public policy. It would reduce the rewards to innovation and to taking the risk of being an early entrant by permitting free riding. Finally, it does not make sense to impose inefficient regulation of prices charged to resellers and then to try to offset the incentives created by these inefficient prices by regulating the behavior of CMRS providers. (Section IX)
17. Finally, the Commission has correctly concluded that it should not require facilities-based cellular providers to permit cellular resellers to install their own switching equipment and to purchase unbundled services. However, the Commission's argument—that the relevant market is limited to the services that resellers want to provide—is unsound. The fact that resellers want to provide a particular set of ser-

vices does not imply that that set of services is something that could profitably be monopolized. (Section IX)

III. THE COMMISSION'S RAISING RIVALS' COSTS THEORY

18. The Commission's concern about anti-competitive denial of efficient direct interconnections between CMRS providers is based on a raising rivals' costs theory. The Commission has suggested that one CMRS provider, which I will call Alpha, might find it profitable to deny an efficient direct interconnection to another CMRS provider, which I will call Beta, if doing so would raise Beta's costs more than it would raise Alpha's costs (*Second NPRM* at ¶32).
19. The Commission appears to have in mind the following scenario: The increase in Beta's costs would force Beta to raise its prices for services that it supplies in competition with Alpha, and would reduce the margin it would earn on sales. As a result, Beta would be a less vigorous competitor, would lose subscribers, and might be driven out of business. This would enable Alpha to increase its prices or its sales of subscriptions. Consumers would be harmed by an increase in prices or a reduction in the range of services available.
20. This theory has several serious flaws as a basis for concern over anti-competitive denial of efficient direct CMRS-to-CMRS interconnections. If it denied efficient direct interconnections, Alpha would be likely to increase its own costs, would be unlikely to receive benefits in terms of higher prices and increased sales of subscriptions, and hence would be likely to find that the proposed strategy would reduce its profits.
21. One problem with the Commission's theory is that CMRS carriers are and will continue to be interconnected through the local exchange carrier (LEC). Thus, Alpha's denial of an efficient direct interconnection with Beta could raise Beta's costs at most by the difference between the cost of routing calls through the LEC and the cost of routing them directly. At this stage in the development of CMRS services,

not only the magnitude but the existence of such cost differences is speculative. The Commission has correctly found that "the current network structure whereby the connection is made through LEC facilities has been efficient because of the low volume of CMRS[-to-CMRS] traffic (as compared to landline traffic) even though each CMRS provider has been required to pay interconnection charges to the LEC" (*Id.* at ¶30).

22. A second problem with the Commission's theory is that Alpha's denial of an efficient direct interconnection with Beta would be costly for Alpha itself. If a direct interconnection were efficient, Alpha and Beta taken together would reduce their costs by having a direct interconnection. Absent government intervention, in negotiating for a direct interconnection that would be efficient, obviously Alpha could secure for itself some of the cost savings, since Beta would recognize that Alpha would have no incentive to enter an agreement from which it received no benefit. In order to profit from a strategy (denial of an efficient direct interconnection) that increased its own costs, Alpha would have to gain subscribers and increase its prices *by enough to outweigh its foregone savings in interconnection costs*.
23. A third problem with the Commission's theory is that it depends upon the implicit assumption that Alpha and Beta compete with each other to sell subscriptions and calls in a very narrow antitrust market. In order to evaluate a raising rivals' costs theory, one must define the relevant market(s) in which the bad actor would allegedly exercise market power after raising the costs of, or excluding, its rivals. In this respect and others, the analysis of raising rivals' costs follows the lines of predatory pricing theory. See *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574 (1986).
24. In evaluating the Commission's theory, the relevant markets are the markets in which CMRS providers compete with each other and with others to sell subscriptions and calls. Because consumers would in fact have close substitutes for the services offered by Alpha and Beta,

and because other firms could introduce close substitutes in response to an increase in the prices charged by Alpha and Beta, Alpha could not gain from denying a direct interconnection to Beta. If Gamma, Delta, and other entities offer close substitutes for a significant number of Alpha and Beta subscribers, then Alpha's denial of an efficient interconnection would raise costs for both Alpha and Beta and lead to a shift in subscribers away from Alpha and Beta, on the one hand, to Gamma and Delta, on the other. Alpha's profits would be reduced because it would lose subscribers and because the number of calls per subscriber would decline if Alpha tried to raise its prices to cover the higher cost of its calls to Beta. Because there is no relevant market in which the bad actor could reasonably expect to exercise market power as a result of its alleged actions to raise rivals' costs, the theory does not make sense and should be abandoned.

25. With regard to the antitrust markets that are relevant to this proceeding—the markets in which CMRS providers compete to sell subscriptions and calls—the Commission itself has stated: “As a result of our recent spectrum auctions, as well as other developments in the industry, we believe that all commercial mobile radio services will be provided on a competitive basis by multiple facilities-based competitors in each license area in the near future, potentially lessening the need for regulatory intervention” (*Second NPRM* at ¶36). In fact, rather than merely “potentially lessening the need for regulatory intervention,” the Commission's conclusion regarding competition implies that there is no antitrust basis for regulatory intervention.
26. In short, as with predatory pricing, raising rivals' costs is not a sensible competitive strategy in a market in which no firm can exercise long-term market power. Indeed, if the exercise of such power were possible, raising rivals' costs still would not always be a profitable strategy for a competitor because of costs that the strategy would impose on the bad actor itself. Further, just as it is difficult to distinguish predatory from competitive pricing, it is easy to confuse pro-

competitive denials of (inefficient) interconnection with attempts to raise rivals' costs. Policies attempting to prevent anticompetitive practices may hold more dangers than potential benefits for consumers because they may deter far more pro-competitive than anti-competitive behavior. If the government mandates interconnections, it will force some CMRS systems, and induce others, to make inefficient interconnections that raise the costs of doing business. Such a result is anti-competitive.

27. Proponents of federal or state intervention to mandate interconnection should bear the burden of demonstrating that intervention has benefits that outweigh its costs. It is unlikely that the Commission's raising rivals' costs theory provides a rationale for anti-competitive denial of efficient direct CMRS-to-CMRS interconnections. Thus, the Commission has provided neither a theory nor empirical evidence that efficient direct interconnections are likely to be denied in an effort to gain market power.

IV. COSTS OF INTERCONNECTION REQUIREMENTS

28. The imposition of interconnection requirements on CMRS providers by the Commission would have no benefits. It would, however, likely result in substantial costs. First, it would lead to the provision of interconnection services in situations in which the value of the interconnection was less than the cost. The direct costs of interconnections are discussed by Nelson (Nelson Declaration at ¶10). CMRS providers, resellers, and PMRS licensees would likely request inefficient interconnections because of pricing distortions—that is, because they would be able to obtain services at artificially low prices that do not fully reflect their costs. Regulation is too imperfect to discriminate accurately between situations where interconnection is efficient and other situations where it is inefficient. Both to avoid lengthy proceedings and as a result of such proceedings, CMRS providers would be induced to provide interconnections that are not worthwhile from society's point of view.

29. Interconnection requirements, like many other types of regulation, also impede technological progress and innovation. The possible adverse effects of interconnection requirements on innovation can be illustrated by considering a hypothetical new switching technology for mobile communications that would lower switching costs by 50 percent. Assume that customer equipment is transparent to the new technology, but that interconnecting carriers' switches are not. Any given carrier that adopts the new technology therefore would not be able to interconnect directly with a carrier that does not adopt it. Absent an interconnection requirement, a carrier deciding on whether to adopt the new technology would balance the gains from investing in the new technology (lower costs, lower prices, higher market share) against the costs (increased costs from interconnection through the LEC switch). Assuming competitive conditions and no direct interconnection requirements, it is reasonable to suppose that this complex decision would be made in a way that best serves the interests of customers. However, a direct interconnection requirement would make the new technology unusable until all carriers were prepared to adopt it, or at least would reduce the cost savings by requiring the innovating carrier to maintain two regimes. Thus, the interconnection requirement would impede innovation.
30. Even without explicit regulation of prices for interconnection services, imposition of an interconnection obligation inevitably brings with it implicit regulation of prices. Presumably, prices will have to be "reasonable" and "non-discriminatory." It follows that imposition of interconnection obligations would suffer from many of the problems of price regulation. Price regulation limits the ability of regulated firms to respond to changes in technology, cost and demand conditions, and deters new investments, quality improvements, new services, and entry by reducing returns on pro-competitive activities. The distorting effects of price regulations that limit returns on investments are likely to be greatest in industries such as CMRS that are characterized by rapid growth, technological change, and high risk. Imagine that the prices of automobiles had been regulated

during the early days of the Ford “monopoly.” It is unlikely that investment by others in new technologies and products would have taken the same path that it did.

31. In industry after industry, regulation has restricted the introduction of new products and new sources of competition. For example, Commission regulations in the late 1960s and early 1970s delayed the growth of cable television, harming consumers (Owen and Wildman, *supra* ¶1, at 215). Other industries in which regulation was used to prevent or restrict competition include international telecommunications, title insurance, surface freight transportation, and airlines (Owen and Braeutigam, *supra* ¶1; Peltzman, “The Economic Theory of Regulation after a Decade of Deregulation,” *Brookings Papers on Economic Activity: Microeconomics*, 1989, 1-41).
32. Mandatory access requirements may create free rider problems that dampen the incentives of CMRS providers to make improvements in their networks, particularly where access is provided to a firm that is also a competitor. Returning to the example of the Ford “monopoly,” it is unlikely that the world would have been a better place if Ford had been required to “unbundle” so that Nash, for example, could sell Ford chassis with Nash bodies, or had been required to allow Nash to use its assembly lines, intellectual property, distribution facilities, and other assets.
33. It is also important to remember that government regulations involve substantial administrative costs both for the industries being regulated and for the government.

V. MARKET DEFINITION

34. Any examination of market power and competition must begin with market definition. A group of products or services and an associated geographic area constitutes a relevant market for antitrust analysis if it is the smallest set of products and the smallest area that is susceptible in principle to being profitably monopolized, as well as being rel-

evant to the issue under investigation. In evaluating the Commission's raising rivals' costs theory, the relevant market is the market in which CMRS providers such as Alpha and Beta compete with each other and with others to sell subscriptions and calls.

35. The *Second NPRM* does not attempt to define this market. Instead, the Commission attempts to define the relevant markets in which there is competition to terminate the calls originated from a single CMRS system. One part of the Commission's theory is an assumption that Alpha's ability to raise Beta's costs—or harm Beta—depends on the share of Beta's calls (or of some subset of Beta's calls, such as voice calls) that are terminated by Alpha. Another part of the Commission's theory is that a necessary condition for Alpha to have an incentive to deny an efficient interconnection to Beta is that the share of calls (or of some subset of calls) originating from Beta that are terminated by Alpha significantly exceeds the share of calls (or some subset of calls) originating from Alpha that are terminated by Beta (*Second NPRM* at ¶32).
36. In defining an antitrust market, the Commission is trying to determine whether the shares in question should be calculated from a base consisting of all calls originating from Beta, regardless of whether they are local or long distance, voice or data transmissions, and terminated by an LEC or a CMRS provider. The Commission is also considering narrower product and geographic markets, such as voice calls terminated by other local CMRS providers (*Id.* at ¶¶33-34).
37. The Commission is attempting to define a relevant antitrust market *for the termination of calls originating from Beta*. However, there is no such antitrust market. CMRS providers compete for subscribers and, to the extent customers subscribe to more than one service, they compete to originate individual calls. When CMRS providers compete for subscribers, they compete both to originate calls from and to terminate calls received by these subscribers. There is no separate competition, and thus no separate antitrust market, for call

termination, let alone for termination of calls originating from the system of a single provider, Beta. When CMRS providers compete to sell calls to people that subscribe to more than one service, they compete to sell call originations. Calls will be terminated by the system to which the called party subscribes.

38. The reason for defining relevant markets in this proceeding is to determine whether Alpha could reasonably expect that denial of an efficient interconnection with Beta (and perhaps others) would enable it to gain significant market power in a market in which Alpha competes with Beta to sell subscriptions and calls. To define the relevant markets in which Alpha and Beta compete, the initial issue is the extent to which different services are substitutes from the point of view of people that are deciding on the services to which they will subscribe and which they will use to make calls. For example, one must ask whether a significant number of subscribers to mobile voice services would switch to become subscribers to mobile non-voice services or would rely on landline services if the price of all mobile voice services were to increase. Also, one must ask whether CMRS providers that are not currently supplying voice services would begin to offer voice services if the relative price of voice services increased.

A. Relevant Product Markets

39. To determine whether a product or group of products constitutes an antitrust product market, one begins by assuming that a hypothetical single firm controls the entire supply of the product(s) in question. If that firm could increase its profits by raising prices significantly above competitive levels, then an antitrust product market has been defined. However, if a price increase by a hypothetical single firm would be unprofitable because consumers would switch in significant numbers to other products, then the market has been defined too narrowly for antitrust analysis.
40. One cannot determine whether two communications services are competitive merely by comparing prices, because there may be sig-

nificant non-price differences between them. Many consumers may regard a given service and a second less convenient but lower-priced service as close substitutes. In that case, an increase in the price of either service will lead to a significant shift in demand for the other service, and the services would be in the same relevant product market. Thus, for example, CMRS and coin telephone services may be in the same relevant product market.

41. In the *Second NPRM* (§33), the Commission suggests that in evaluating the potential for a CMRS firm to profit from actions intended to raise rivals' costs, "there are at least three possible relevant product markets: (1) local exchange, both landline and wireless; (2) all commercial mobile radio services; and (3) mobile voice services."
42. Where there is substantial uncertainty about how to define the relevant product market, it sometimes makes sense to use more than one potential product market to determine whether broader and narrower markets have different policy implications. In such cases, it often turns out that the different product markets lead to the same policy conclusion. If one finds no reason for concern about market power in one plausible product market, typically it is not necessary to examine broader product markets even though they may more accurately reflect competitive conditions.
43. In declarations in recent Commission dockets on related cellular issues (§1, *supra*), I made the assumption that landline services are not in the relevant product market in which cellular and cellular-type services compete. Since my analyses demonstrated that proposed regulations were not justified even if landline services were excluded from the antitrust markets in which CMRS services compete, it was

unnecessary to analyze competition between landline and CMRS services in detail.

44. Suppose for the sake of argument that there is evidence demonstrating that landline services are not in the antitrust market in which CMRS services compete. In that case, the most plausible relevant antitrust market is likely to be all CMRS services. Even though not all CMRS services would be close substitutes for all customers, there are likely to be significant number of customers for which various pairs of CMRS services are close substitutes. Moreover, because a given segment of spectrum can be used to produce different types of services, CMRS providers can change the services they offer so that they compete with a particular type of CMRS service that experiences an increase in relative price.
45. Nonetheless, there may be narrower antitrust markets that would be relevant to certain issues. In my earlier declarations, I suggested that the relevant antitrust markets that might make sense in analyzing competition involving cellular carriers are *unlikely to be narrower than* what I defined as *mobile telecommunications services, wireless data transmission services, and paging services*. The relevant markets may in fact be substantially broader than these. These possibilities are not exhaustive.
46. In the *Second NPRM*, the Commission suggests that mobile voice services might be a relevant antitrust market in which some CMRS providers compete. It appears unlikely that mobile voice services is a relevant antitrust market. For example, in many cases voice and e-mail are likely to be close substitutes for buyers, and voice and non-voice paging systems are likely to be close substitutes for other buyers. Also, some CMRS providers that are using their licenses and spectrum to provide non-voice services could be expected to provide voice services if the price of the latter increased. As a result, these CMRS providers should be included as suppliers in the relevant markets in which mobile voice services are sold.

47. Among the candidates for relevant product markets in which cellular services may compete, the one that is now, and is likely to remain, most concentrated is *mobile telecommunications services*, which I define as the collection of services of the type that cellular and broadband PCS offer or will offer within the next three to five years. This includes not only voice services but non-voice services, such as e-mail. As I will explain further below, at a minimum the participants in this market include cellular providers and broadband PCS providers with at least 20-30 MHz of spectrum. Participants are also likely to include broadband PCS licensees with 10 MHz of spectrum and ESMR providers with 5-10 MHz of spectrum. There may eventually be other participants as well, for example satellite-based services such as Iridium. Also, in some cases consumers are likely to be in a position to substitute landline telephone, paging, and two-way mobile radio services for cellular-type services.
48. The definition of the mobile telecommunications services market used in this declaration is based on the fact that cellular, PCS, and ESMR licensees are all authorized by the Commission to provide the full array of mobile services. It is also based on the conclusion that "all portions of the electromagnetic spectrum that have been allocated to the provision of mobile telecommunications services can be used to provide all of the same services and at about the same cost" (Besen and Burnett, "An Antitrust Analysis of the Market for Mobile Telecommunications Services," Dec. 1993, at 18).
49. Cellular systems may also compete in other relevant product markets, such as *wireless data transmission services* and *paging services*. However, any such product market that may exist would have more participants and be less concentrated than the market defined for mobile telecommunications services. Because of the additional competitors and scope for entry for such services, insofar as the regulations at issue in the present proceeding are concerned no additional competitive issues are likely to arise in such markets that do not arise in a market for mobile telecommunications services.

B. Relevant Geographic Markets

50. CMRS suppliers compete in providing services in connection with both local and long-distance calls. Definition of the precise geographic areas appropriate for analysis of both local and long-distance calls is complicated by the fact that the relevant licensees (cellular A, cellular B, broadband PCS A and B, broadband PCS C-F, ESMR, etc.) serve or will serve different, overlapping areas.
51. In order to define geographic markets in any specific situation, one must determine the extent of feasible geographic price discrimination. To the extent that price discrimination is not feasible, and uniform prices must be charged over a wide geographic area, geographic markets will be broader than if price discrimination is feasible. The broader are geographic markets, the greater will be the number of participants in the markets, and typically the lower will be concentration. For example, if the geographic market is broader than the Metropolitan Statistical Areas (MSAs) used for cellular licenses, the number of cellular and broadband PCS competitors in the market will exceed the number of licenses (including Basic Trading Area (BTA) and Major Trading Area licenses) valid in any single MSA. Market share and concentration measures are therefore likely to be biased upward if they are computed based on an implicit assumption that cellular licensees in different MSAs and PCS licensees in different BTAs are not in the same antitrust geographic markets (Besen and Burnett make the same point at n. 46).

VI. INTERCONNECTION OBLIGATIONS OF OTHER NETWORKS

52. Viewed from a broader policy perspective, the Commission would not be taking an unusual position in deciding not to require CMRS-to-CMRS interconnection. Issues of denial of access and interconnection arise with some frequency in antitrust cases, or as antitrust issues in regulatory proceedings, and it is widely-accepted doctrine that mandatory access and interconnection should be imposed only

when extreme essential facility conditions exist. The reason for the reluctance of policy makers to impose access or interconnection requirements is the chilling effect of such measures on the incentives of the owner of the alleged essential facility. In effect, the owner's property rights are abridged, reducing the incentive to invest in the facility. For a fuller discussion, see my article, "Determining Optimal Access to Regulated Essential Facilities," 58 *Antitrust Law Journal* 887, 1989.

53. Although the "essential facility" doctrine has been used in antitrust to mandate access to networks (e.g., *MCI Communications Corp. v. American Tel. & Tel. Co.*, 708 F.2d 1081 (7th Cir.), cert. denied, 464 U.S. 891 (1983)), access is granted in only limited, relatively rare, circumstances. In order for the essential facility doctrine to be applicable, it is necessary (in addition to other requirements) that (1) a monopolist control a facility access to which is essential to the viability of competitors (and competition); (2) competitors be unable to duplicate the essential facility; and (3) competitors have no reasonable alternative to its use (*Id.* at 1132-33). A CMRS provider, of course, meets none of these conditions. When the alleged anti-competitive effect is the monopolization of another market (as in the case of "control" over CMRS interconnection services leading to a monopoly in the supply CMRS services to end users), there is also a requirement that the owner of the essential facility either monopolize or have a dangerous probability of monopolizing the other market (*In re Air Passenger Computer Reservation Systems Antitrust Litigation*, Central Distr. CA, Master File No. mdl 667-ER, Aug. 12, 1988, at 17-18).
54. Three examples illustrate the conditions that must exist before the essential facilities doctrine will apply to an antitrust case. In *In re Air Passenger Computer Reservation Systems Antitrust Litigation*, the plaintiffs argued that the defendant airlines (American and United) used control over access to their computer reservation systems (CRSs) to monopolize the market for air transportation. The District Court dis-

missed these claims with respect to national air transportation because, even though CRSs might be essential facilities, the defendants were not in a position to monopolize national air transportation because each had a share of less than 50 percent of the latter (*Id.* at 19).

55. In some cases, the Department of Justice (DOJ) has sought to allow thrift institutions (e.g., savings and loan associations) to connect to an automated clearing house (ACH) used by banks for electronic funds transfer. DOJ's reasoning is that to have equal footing in competing with banks for other services (e.g., accepting direct payroll deposits), thrift institutions must have access to an ACH, and ACHs are often controlled by rival banks. Only when there is a sole ACH in an area, and thrift institutions cannot create an economically viable substitute for the ACH because the Federal Reserve Bank subsidizes it, has DOJ sought access for thrift institutions (Blumenthal, "Compulsory Access to ATM Networks," mimeo, n.d., at 6-8).
56. In the case of other networks where "seamless" access may be valued by consumers, the government has recognized that universal access by competitors may not be the best policy. For example, the Department of Justice has taken the position that denying access or having discriminatory rules and usage fees for ATM networks may be appropriate if the ATM network lacks market power. Without market power, limiting ATM network access to only one type of financial institution does not foreclose other types of financial institutions from access to other ATM networks. Discriminatory fees may be appropriate to reward the founding members of an ATM network for their initial risks. "However, in markets where there is a single shared system with market power, such restraints may lessen competition in the provision of retail and wholesale ATM services and ATM processing" (Rule, "Antitrust Analysis of Joint Ventures in the Banking Industry: Evaluating Shared ATMs," 1985, reprinted in Baker and Brandel, *The Law of Electronic Fund Transfer Systems*, 1988, at A139-49).

57. In the case of interconnections between CMRS providers, none of the conditions of the essential facilities doctrine are met.

- Interconnections between CMRS providers obviously are not essential because virtually all inter-CMRS traffic now is routed through LECs. For the foreseeable future, the LEC provides an economically viable alternative. Further, even if it did not, lack of direct access to a single competitive CMRS provider is unlikely to be a serious impediment to competition, because the fraction of calls originating on any given competing CMRS destined for the CMRS denying access is likely to be very small.
- CMRS interconnections are already duplicated by interconnections through the LEC. As long as a majority of inter-CMRS traffic is routed through the LEC, one can conclude that the LECs provide economically viable alternatives for direct interconnections.
- There is no likelihood of monopolization of CMRS services. With the auction of PCS spectrum, there are likely to be several providers of CMRS services in an area and no provider will have a share greater than 50 percent of a relevant market. Accordingly, there is no likelihood of monopolization.

Because none of the conditions exist that are necessary for classifying CMRS interconnections as essential facilities, there is no rational basis under this doctrine to mandate direct CMRS-to-CMRS interconnections.

VII. ROAMING

58. The Commission has requested comments on whether it would be efficient for it to impose on CMRS providers obligations to enter into roaming agreements with other CMRS systems, on whether roaming

requires direct interconnection, and on whether roaming requires access to proprietary databases maintained by other CMRS systems.

A. Efficient Roaming Services

59. CMRS service can be provided to roamers in different ways. At one extreme, a roamer may originate calls outside its service territory simply by entering a credit card number. This service can be provided without a direct interconnection, a roaming agreement, or exchange of data between CMRS systems. At the other extreme, CMRS systems may provide seamless roaming service, which enables subscribers to travel among service territories, continuing, originating, and receiving calls and being billed just as though they were within their home service territories. There are many possible levels of roaming service between these extremes.
60. The Commission has stated that it is “aware of customer concerns regarding the availability and pricing of roaming service and hope[s] that in the future, *all CMRS providers will respond by implementing nationwide seamless roaming networks* and by offering roaming service to interested subscribers at attractive, cost-based rates” (*Second NPRM* at ¶56, emphasis added). The Commission has not explained the basis for its suggestion that nationwide seamless roaming service would be efficient for all CMRS providers. One should compare the value consumers place on seamless roaming service and its costs with the value and costs of alternative types of roaming service. The efficient level of roaming service may differ between cellular, ESMR, PCS, and other systems, and between providers in different parts of the country (e.g., urban and rural areas).
61. In the context of the Commission’s concerns about anti-competitive behavior on the part of CMRS providers, the issue is whether it is likely that CMRS providers will fail to provide the efficient level or levels of roaming service because of their hypothetical incentives to gain market power. The raising rivals’ costs theory proposed by the Commission has the same types of weaknesses as a basis for concern

over the exercise of market power in decisions related to roaming as it has with regard to interconnection.

62. There are two cellular systems in each area. As a result, no cellular system is an essential or bottleneck facility access to which is required for roaming service in any particular area, let alone for coverage of much of the nation. Furthermore, there are non-cellular systems, and additional non-cellular systems are likely to be deployed first in the areas where the demand for roaming services will be greatest. In addition, there is vigorous competition among all types of CMRS providers to build national networks. These facts make anti-competitive denial of roaming service unlikely. Suppose that one CMRS provider, Alpha, refused to supply efficient roaming services to the subscribers of another CMRS provider, Beta, when they were in Alpha's service area. Given the competition any CMRS provider is likely to face in selling subscriptions and roaming services, there is no basis for expecting that Alpha could gain market power in selling either subscriptions or roaming services by raising Beta's costs. Furthermore, in many cases, Alpha and Beta simply would not be competitors for subscriptions or roaming services. To the extent Alpha and Beta offer services that are complements, Alpha's incentive would be to reduce, not to increase, Beta's costs, because a reduction in Beta's costs would increase the demand for Alpha's services. Also, if Alpha were to refuse to supply efficient roaming services to Beta's customers, Alpha would forego the profits it could earn selling such services.

B. Provision of Roaming Services to Non-cellular Subscribers

63. The Commission has asked whether CMRS providers should be required to allow other CMRS providers' subscribers to use their systems on a roaming basis (*Second NPRM* at ¶45). Since the Commission requires that cellular system licensees provide roaming service to subscribers of other cellular systems upon request (*Id.* at ¶46), the principal issue raised by in the *Second Notice* that is relevant to

cellular systems is whether the Commission should extend the obligations of cellular systems to include provision of roaming services to subscribers of non-cellular systems.

64. There are three reasons that consumers are likely to be injured by the imposition on cellular providers of obligations to supply roaming services to non-cellular systems. *First*, such roaming may not be technically feasible, or it may involve a cost that exceeds its value.
65. *Second*, a requirement that cellular systems provide roaming services to non-cellular systems—which would enable non-cellular systems to obtain roaming agreements on terms not available in the marketplace—would reduce the demand for roaming services from non-cellular systems. Other things equal, this would tend to delay the deployment of non-cellular systems in some areas.
66. *Third*, there is no reason to believe that there is an anti-competitive incentive for cellular systems to deny roaming services (see ¶¶61-62, *supra*). Cellular systems have the proper incentive to provide roaming services without regulation because refusal to provide efficient roaming services would cause the cellular systems to forego the opportunity to earn profits on such services.

C. Interconnection and Roaming

67. Roaming does not require direct interconnection among CMRS systems, since all the necessary voice and data transmissions between any two CMRS systems that would support any level of roaming service can be made through their LECs. Because roaming does not require direct CMRS-to-CMRS interconnection, consideration of roaming services does not alter the conclusions reached earlier in this declaration regarding the merits of interconnection obligations.

D. Access to Proprietary Databases and Roaming

68. The Commission is evaluating whether it may be efficient for it to impose on CMRS carriers obligations to provide to other CMRS sup-

pliers access to proprietary databases (*Second NPRM* at ¶45 and n.77). The Commission believes access to such databases may be necessary for the provision of roaming services, and specifically nationwide seamless roaming. This issue must be broken into three parts. First, what is the efficient level of roaming service (see ¶¶59-60, *supra*)? Second, what access to databases is efficient for this level of service? Third, do CMRS systems have an anti-competitive incentive to deny this efficient access to their proprietary databases?

69. There are two different situations to consider. *First*, a non-cellular CMRS system may want a cellular provider to supply roaming services to the non-cellular system's customers when the latter are roaming in the cellular system's service area. A basic level of roaming service can be provided by a cellular carrier without any access to the non-cellular system's databases, relying, for example on credit cards. To avoid use of credit cards and to have the non-cellular system bill the subscriber for roaming services provided by the cellular system, the cellular system would need access to a limited amount of data maintained by the non-cellular system. For example, the cellular system would need the ability to determine the services to which the roaming customer has subscribed (*Second NPRM* at n.84). However, the non-cellular system does not need any access to the cellular system's databases. The information the non-cellular system needs from the cellular system is that the roamer can be reached through the cellular system's switch.
70. *Second*, a non-cellular CMRS system may want to sell roaming services to the cellular system's subscribers when the latter are roaming in the non-cellular system's service territory. In this case, the requirements are the reverse of those discussed in the preceding paragraph. If the cellular provider were to limit access to its proprietary databases by the non-cellular system in this situation, it should be presumed that the level of access sought by the non-cellular system is not efficient when all costs are taken into account. The cellular provider has the appropriate incentive to provide access to

the data that the non-cellular system needs to provide efficient roaming services to the cellular system's customers.²

71. Mandatory provision of access to its proprietary databases may involve substantial costs for a CMRS provider and its subscribers. One valid business reason that a system may have for limiting access to its databases is concern for the privacy of its subscribers. Another is concern that the system seeking access would use the proprietary data to compete for the system's customers. A government requirement that CMRS systems provide proprietary data to their competitors would be undesirable. Such a requirement would reduce providers' returns from pro-competitive activities, including acquiring the data in question, marketing their services, and developing new services. This outcome would be anti-competitive.
72. In sum, the Commission was correct in deciding not to take action to impose additional obligations on CMRS systems to provide roaming service, and in deciding not to take action to regulate rates charged to end users for roaming services.

VIII. EXTERNALITY ARGUMENTS FOR MANDATORY INTERCONNECTIONS AND COMPATIBILITY STANDARDS

A. Direct Interconnections between CMRS Providers

73. Proponents of mandatory interconnection among CMRS providers may suggest that direct interconnections have various types of external benefits, for example, it might be alleged that they would increase competition in some market, or that they would increase reliability for third parties because they would provide "valuable network redundancy" (*Second NPRM* at ¶28).

² While the discussion in the last few paragraphs has been phrased in terms of a cellular and a non-cellular system, the same reasoning applies to any two CMRS systems.

74. Some of the benefits of the competitive activities of a particular market participant may be realized by buyers that do not engage in transactions with the participant in question, for example, customers may benefit from the lower market prices that result from the entry of a new competitor even if they do not buy from the entrant. Therefore, individual competitors may not take into account all the benefits of their activities (Krattenmaker and Salop, "Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power over Price", 96 *Yale L.J.* 209, 1986).
75. In the case of CMRS, it might be argued that direct interconnection between two collocated providers would increase competition faced by their LEC and result in lower prices charged by the LEC. To make this argument, it would be necessary to explain how, and to provide evidence that, direct CMRS-to-CMRS connections would increase competition faced by the LEC in selling services to third parties. Such an effect appears speculative. Suppose, for the sake of argument, that there were evidence of such an effect. If that were all there was to the story, and if there were reason to believe the government would be able to determine which interconnections would be efficient taking into account this external benefit, it might be suggested that society would be better off if the government were to mandate interconnection in some cases. A similar argument might be made with regard to network redundancy. However, this story is incomplete.
76. One problem with the preceding argument is that there is likely to be an opposite incentive for CMRS providers *to interconnect even when it is inefficient for them to do so*. LECs are likely to price their interconnection services above marginal cost for at least two reasons. *First*, the LEC's long-run cost of supplying incremental interconnection services is likely to be below its average cost. In that case, because the LEC must recover its average cost to maintain service in the long-run, it must receive prices above its marginal cost. *Second*, rate regulation may not hold interconnection prices down to the average

cost of supplying interconnection services. Because the price of LEC interconnection services is above marginal cost, CMRS providers have an incentive to interconnect directly in order to by-pass the LEC switch even when interconnection through the LEC is efficient, that is, minimizes costs for society as a whole. The problem is that profit-maximizing CMRS providers will interconnect based upon the price charged by the LEC, not based on the LEC's (and society's) marginal cost. In situations in which the cost of direct interconnection is between the LEC's price and the LEC's marginal cost, CMRS providers will interconnect directly and by-pass the LEC even though this is not efficient.

77. Another problem with the story is that mandating direct CMRS interconnections may actually result in higher prices charged by the LEC for services provided to third parties. A direct CMRS-to-CMRS interconnection requirement would reduce the demand for services that could be supplied by potential entrants (such as cable companies) that are considering providing switching and landline services in competition with the LEC. As a result, a CMRS-to-CMRS interconnection requirement would tend to slow the entry of such competitors and delay the benefits of competition.
78. A direct CMRS-to-CMRS interconnection requirement may also lead to higher LEC prices for other CMRS providers that continue to buy interconnection services from the LEC. *First*, suppose that the LEC's interconnection prices are constrained by the fact that an increase in prices would cause some CMRS providers (for example, those with the largest volumes of inter-CMRS traffic) to interconnect directly with each other, causing a sufficient reduction in the LEC's sale of interconnection services so that the LEC's profits would decline. Next, suppose the government required direct CMRS-to-CMRS interconnections where the traffic exceeded some threshold level. In that case, the LEC would lose the customers that were constraining its prices. No longer faced with the prospect of losing these customers if it increased prices, the LEC would no longer find it

unprofitable to raise prices, and CMRS providers that continued to rely on the LEC for interconnection services would be harmed by an increase in prices. *Second*, consider the case in which the LEC's prices for interconnection services are constrained by regulation. Rate regulation that allows the LEC to recover a fixed amount of revenue from certain classes of customers may allow the LEC to raise prices to "captive" customers if, as a result of government intervention, it loses sales that it otherwise would have made to the CMRS providers that interconnect directly.

79. In conclusion, there are many complex, opposing incentives and uncertain effects that would need to be considered before one could reach a conclusion that, because of externalities, the private incentives of CMRS providers would lead to too few direct interconnections. It is not sufficient to argue that additional interconnections would have external benefits. One must compare all benefits with all costs. An interconnection is justified only if it has benefits that outweigh its costs. On balance, CMRS providers may have an incentive to have too many direct interconnections, because they may have an incentive to by-pass the LEC even when doing so would be inefficient. Even if there were a likelihood that the market would fail to produce some direct interconnections that would be efficient taking into consideration all external effects, there is unlikely to be a way for the government to distinguish these cases from the many other cases in which a direct interconnection would be inefficient even considering any external effects. Thus, consumers are unlikely to benefit from government efforts to impose interconnection requirements based on speculative external benefits, either through a rule or in the context of case-by-case analyses.

B. Common Air Interface Technology

80. The Commission has asked for comments on whether it should require technical compatibility to facilitate roaming (*Second NPRM* at ¶¶45, 56). It is, therefore, necessary to ask whether there is substan-

tial evidence of a market imperfection which leads CMRS providers to choose the wrong technology, whether this could be corrected by a voluntary cooperative industry organization, and whether the government could be expected to do any better.

81. Some CMRS subscribers value roaming ability and thus compatibility of their handsets with other CMRS systems. The question is whether CMRS providers have appropriate incentives to take into consideration the value of roaming in making choices regarding technology. There is every reason to believe CMRS providers do have appropriate incentives. *First*, to the extent subscribers value the ability to obtain roaming service elsewhere, a CMRS provider has an incentive to choose a technology that will be compatible with the technologies chosen by providers in areas in which its subscribers want the ability to roam. By making such choices, the CMRS provider increases the price it can charge for subscriptions or the number of subscriptions it can sell. *Second*, a CMRS provider has an incentive to choose a technology that will be compatible with the technologies used by providers whose subscribers are willing to pay for roaming services that the first provider could supply. By making such choices, the CMRS provider increases its sales of services to roamers. Under these circumstances, there is no reason to believe that the demand for roaming services is inadequately accounted for in decisions about technology or the adoption of a common standard.
82. It might appear that current cellular customers enjoy the benefit of being able to use their phones throughout the U.S. because there is a common air interface, which happens to have been imposed by the government. However, in light of the analysis in the preceding paragraph, it may well be that market forces would have produced this result absent government imposition of a standard. Alternatively, market forces may have produced a superior outcome to common use of the particular standard that was imposed. Current information suggests that the Commission should relax the Advanced Mobile Phone Service (AMPS) standard requirement for cellular systems and